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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,191	11/20/2003	Hsin-Hui Lee	TS03-179	9793
47390	7590	04/06/2006	EXAMINER	
THOMAS, KAYDEN, HOSTEMEYER & RISLEY LLP 100 GALLERIA PARKWAY SUITE 1750 ATLANTA, GA 30339				PHAM, THANHHA S
ART UNIT		PAPER NUMBER		
				2813

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/718,191	LEE ET AL.	
	Examiner Thanhha Pham	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 10 March 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 14-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 14-27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 November 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input checked="" type="checkbox"/> Other: <u>attachment</u> . |

DETAILED ACTION

This Office Action is in response to Applicant's Amendment dated 03/10/2006.

Claim Objections

1. Claim 16 is objected to because of informalities. Appropriate correction is required to clarify scope of claim.

- With respect to claim 16, line 2, "a ball grid array (SBGA) like structure" should be changed to "a ball grid array (SBGA) structure"

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 14-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung et al [US 2002/0056924] previously applied.

- With respect to claim 14, Chung et al. (fig. 10, text pages 1-5) discloses an integrated circuit chip package comprising:
 - an integrated circuit chip (410, text [0061]) attached to a substrate (422);
 - a stress buffering material (415, text [0061], [0046]-[0048]): *insulation material 415, the same as insulation material 215, being made of epoxy resin is a stress buffering material*) only covering corners of said integrated circuit chip (210); and

an encapsulation material (430, text [0061], [0017], [0049]: *molding encapsulate* 430) coating said integrated circuit chip and a portion of said substrate.

- ▶ With respect to claims 15-16, Chung et al. (fig. 10, text [0046]) discloses said integrated circuit chip is attached to said substrate by a ball grid array (SBGA).
- ▶ With respect to claim 17, Chung et al. (fig. 10) discloses that said encapsulation material (430) covers said stress buffering material (415). Said stress buffering material (415) of Chung et al, the same material as of Applicant's stress buffering material, would prevent delamination of said encapsulation material at said at least one corner of said integrated circuit chip.
- ▶ With respect to claim 18, Chung et al. (fig. 10, text [0048]) discloses that said stress buffering material (415) comprises an epoxy or resin.
- ▶ With respect to claim 19, Chung et al. (fig. 10, text [0048]) discloses that stress buffering material (415) has the same material as Applicant invention thus the stress buffering material (415) would have the same low coefficient of thermal expansion.
- ▶ With respect to claim 20, Chung et al. (fig. 10, text [0050]) discloses that said integrated circuit chip (410) contains low dielectric constant dielectric layers (416, polyimide). Note that polyimide is a low dielectric constant dielectric layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Chung et al [US 2002/0056924] previously applied, in view of Tomoko et al. [JP 406216282A] previously applied.

► With respect to claim 21, Chung et al. (fig. 10, text pages 1-5) discloses an integrated circuit chip package comprising:

an integrated circuit chip (410, text [0061]) having a first surface and a second surface opposite thereto, wherein said second surface is attached to a substrate (422);

a stress buffering material (415, text [0061], [0046]-[0048]: *insulation material 415, the same as insulation material 215, being made of epoxy resin is a stress buffering material*) covering at least one corners of said integrated circuit chip (210), wherein a part of the first surface is not covered by the stress buffering material; and

an encapsulation material (430, text [0061], [0017], [0049]: *molding encapsulate 430*) coating said integrated circuit chip and stress buffering material.

Chung et al. does not mention the stress buffering material having a substantially equal coefficient of thermal expansion matched with integrated circuit chip. However, Tomoko et al. discloses a stress buffering material (2) having a substantially equal coefficient of thermal expansion matched with integrated circuit chip (1) (see title). Therefore, at the time of the invention, it would have been obvious to one ordinary skill in the art to use the stress buffering material having a substantially equal coefficient of thermal expansion matched with integrated circuit chip as taught by Tomoko et al. into the device of Chung et al. in order to reduce thermal stress.

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- ▶ With respect to claim 22, Chung et al. (fig. 10) discloses that said encapsulation material (430) covers said stress buffering material (415). Said stress buffering material (415) of Chung et al, the same material as of Applicant's stress buffering material, would prevent delamination of said encapsulation material at said at least one corner of said integrated circuit chip.
- ▶ With respect to claim 23, Chung et al. (fig. 10, text [0048]) discloses that said stress buffering material (415) comprises an epoxy or resin.
- ▶ With respect to claim 24, Chung et al. (fig. 10, text [0048]) discloses that stress buffering material (415) has the same material as Applicant invention thus the stress buffering material (415) would have the same low coefficient of thermal expansion.
- ▶ With respect to claim 25, Chung et al. (fig. 10, text [0050]) discloses that said integrated circuit chip (410) contains low dielectric constant dielectric layers (416, polyimide). Note that polyimide is a low dielectric constant dielectric layer.
- ▶ With respect to claims 26-27, Chung et al. (fig. 10, text [0046]) discloses said integrated circuit chip is attached to said substrate by a ball grid array (SBGA).

Response to Arguments

4. Applicant's arguments filed 03/10/2006 have been fully considered but they are not persuasive.

In regard to Applicant's argument on page 9, Applicant argues that Chung fails to disclose a stress buffering material only covering corners of said integrated circuit chip. Applicant's argument is not persuasive because Chung clearly discloses a stress

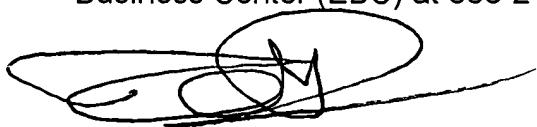
buffering material (415, text [0061], [0046]-[0048]: *insulation material 415, the same as insulation material 215, being made of epoxy resin is a stress buffering material*) only covering corners of said integrated circuit chip (210) (fig. 10). Furthermore, “corner” is defined as the point where converging lines, edges, or sides meet (see Merriam-Webster’s Collegiate Dictionary as attachment). Here, Chung discloses layer 215 covered not only on the top surface of the semiconductor chip (210) but also on the side surface of the semiconductor chip (text [0047]). Therefore, Chung meets and anticipates the claim language.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "THANHHA PHAM".

Thanhha Pham

Merriam-
Webster's
Collegiate
Dictionary

TENTH EDITION

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three ancient Greek architectural orders distinguished esp. by its large capitals decorated with carved acanthus leaves — see ORDER illustration

Cor-in-thi-ans \-thē-anz\ n pl but sing in constr : either of two letters written by St. Paul to the Christians of Corinth and included as books in the New Testament — see BIBLE table

Cor-i-o-lis effect \kōr-ē'-ō-las-, -kōr-\ n (ca. 1946) : the apparent deflection of a moving object that is the result of the Coriolis force

Coriolis force [Gaspard G. Coriolis †1843 Fr. civil engineer] (1923) : an apparent force that as a result of the earth's rotation deflects moving objects (as projectiles or air currents) to the right in the northern hemisphere and to the left in the southern hemisphere

cork \kōrk\ n [ME, cork, bark, prob. fr. Ar qurq, fr. L cortic-, cortex bark — more at CUIRASS] (14c) 1 a : the elastic tough outer tissue of the cork oak that is used esp. for stoppers and insulation b : PHLELEM 2 : a usu. cork stopper for a bottle or jug 3 : a fishing float

cork vt (1535) 1 : to furnish or fit with cork or a cork 2 : to stop up with a cork 3 : to blacken with burnt cork

cork-age \kōr-āj\ n (1838) : a charge (as by a restaurant) for opening a bottle of wine bought elsewhere

cork-board \kōrk-bōrd-, -bōrd\ n (ca. 1893) : a heat-insulating material made of compressed granulated cork; also : a bulletin board made with this material

cork cambium n (1878) : PHELLOGEN

corked \kōrk\ adj (1830) : CORKY 2

cork-er \kōr-kər\ n (1881) 1 : one that corks containers (as bottles) 2 : one that is excellent or remarkable

cork-ing \kōr-īng\ adj or adv (1895) : extremely fine — often used as an intensive esp. before good (had a ~ good time)

cork oak n (1873) : an oak (*Quercus suber*) of southern Europe and northern Africa that is the source of the cork of commerce

cork-screw \kōrk-skru\ n (1720) : a device for drawing corks from bottles that has a pointed spiral piece of metal turned by a handle

corkscrew adj (1815) : resembling a corkscrew : SPIRAL

corkscrew vt (1837) 1 : WIND 2 : to draw out with difficulty 3 : to twist into a spiral ~ vi : to move in a winding course

cork-wood \kōrk-wūd\ n (1756) : any of several trees having light or corky wood; esp : small or shrubby tree (*Leitneria floridana*) of the southeastern U.S. that has extremely light soft wood

corky \kōr-kē\ adj cork-i-er; -est (1756) 1 : resembling cork 2 : having an unpleasant odor and taste (as from a tainted cork) (~ wine) — **cork-i-ness \kē-nəs\ n**

corm \kōrm\ n [NL *cornu*, fr. Gk *kormos* tree trunk, fr. *kerchein* to cut — more at SHEAR] (1830) : a rounded thick modified underground stem base bearing membranous or scaly leaves and buds and acting as a vegetative reproductive structure — compare BULB, TUBER

corm-el \kōr-mēl, kōr-mēl\ n [dim. of *corn*] (ca. 1900) : a small or secondary corn produced by a larger corn

cormo-rant \kōrm-rānt-, kōr-mā-, rānt\ n [ME *cormeraunt*, fr. MF *cormorant*, fr. OF *cormareng*, fr. *corm raven + rānt* of the sea, fr. L *marinus* — more at CORBEL, MARINE] (14c) 1 : any of a family (*Phalacrocoracidae*) of dark-colored web-footed water birds that have a long neck, hooked bill, and distensible throat pouch 2 : a glutinous, greedy, or rapacious person

'corn \kōrn\ n, often attrib [ME, fr. OE: akin to OHG & ON *korn* grain, L *granum*] (bef. 12c) 1 chiefly dial : a small hard particle : GRAIN 2 : a small hard seed 3 a : the seeds of a cereal grass and esp. of the important cereal crop of a particular region (as wheat in Britain, oats in Scotland and Ireland, and Indian corn in the New World and Australia) b : the kernels of sweet corn served as a vegetable while still soft and milky 4 : a plant that produces corn 5 : CORN WHISKEY 6 a : something (as writing, music, or acting) that is corny b : the quality or state of being corny : CORNINESS

corn vt (1560) 1 : to form into grains : GRANULATE 2 a : to preserve or season with salt in grains b : to cure or preserve in brine containing preservatives and often seasonings (~ed beef) 3 : to feed with corn (~ the horses)

corn n [ME *corne*, fr. MF, horn, corner, fr. L *cornu* horn, point — more at HORN] (15c) : a local hardening and thickening of epidermis (as on a toe)

corn-ball \kōrn-bōl\ n (ca. 1949) : an unsophisticated person; also : something corny

cornball adj (1951) : CORNY

corn borer n (1919) : any of several insects that bore in maize: as a : EUROPEAN CORNBORER b : SOUTHWESTERN CORNBORER

corn bread n (1750) : bread made with cornmeal

corn chip n (1950) : a piece of a dry crisp snack food prepared from a seasoned cornmeal batter

corn-cob \kōrn-kāb\ n (1793) 1 : the axis on which the kernels of Indian corn are arranged 2 : an ear of Indian corn

corncob pipe n (1832) : a tobacco pipe with a bowl made of a corncob

corn cockle n (1713) : an annual hairy weed (*Agrostemma githago*) of the pink family with purplish red flowers that is found in grainfields

corn-crake \kōrn-kräk\ n (15c) : a common Eurasian short-billed rail (Crex crex) that frequents grainfields

corn-crib \kōrn-krib\ n (1681) : a crib for storing ears of Indian corn

corn dodger n (1834) chiefly Southern & Midland : a cake of corn bread that is fried, baked, or boiled as a dumpling

corn dog n (1967) : a frankfurter dipped in cornmeal batter, fried, and served on a stick

cor-ne-a \kōr-nē-ə\ n [ME, fr. ML, fr. L, fem. of *corneus* horny, fr. *cornu*] (14c) : the transparent part of the coat of the eyeball that covers the iris and pupil and admits light to the interior — see EYE illustration

— cor-ne-al \-ēl\ adj

corn ear-worm \-'ir-wərm\ n (1802) : a noctuid moth (*Heliothis zea*) whose large striped yellow-headed larva is esp. destructive to Indian corn, tomatoes, tobacco, and cotton bolls

corn-nel \kōr-nēl\ , -nel\ n [ultim. fr. L *cornus* cornel cherry tree; akin to Gk *kranon* cornel cherry tree] (1551) : any of various shrubs or trees (genus *Cornus*) of the dogwood family with very hard wood and perfect flowers; specif: DOGWOOD

cor-ne-lian \kōr-nēl-yān\ n (15c) : CARNELIAN

cor-ne-ous \kōr-nē-əs\ adj [L *cornueus*] (1646) : of a horny texture

cor-ner \kōr-nər\ n [ME, fr. OF *corner*, fr. *corne* horn, corner] (13c) 1 a : the point where converging lines, edges, or sides meet : ANGLE b : the place of intersection of two streets or roads c : a piece designed to form, mark, or protect a corner 2 : the angular part or space between meeting lines, edges, or borders near the vertex of the angle (the southwest ~ of the state) (the ~s of the tablecloth); as a : the area of a playing field or court near the intersection of the sideline and the goal line or baseline b (1) : either of the four angles of a boxing ring; esp : the area in which a boxer rests or is worked on by his seconds during periods between rounds (2) : a group of supporters, well-wishers, or adherents associated esp. with a contestant c : the side of home plate nearest to or farthest from a batter (a fast ball over the outside ~) d : CORNER KICK e (1) : the outside of a football formation (2) : CORNERBACK 3 a : a private, secret, or remote place (a quiet ~ of New England) (to every ~ of the earth) (dark ~s of the mind) b : a difficult or embarrassing situation : a position from which escape or retreat is difficult or impossible (was backed into a ~) 4 : control or ownership of enough of the available supply of a commodity or security esp. to permit manipulation of the price 5 : a point at which significant change occurs — often used in the phrase turn the corner — **cor-nered \-nərd\ adj — around the corner** : at hand IMMINENT (good times are just around the corner)

cor-ner adj (13c) 1 : situated at a corner (the ~ drugstore) 2 : used or fitted for use in or on a corner (a ~ table)

cor-ner vt (1824) 1 a : to drive into a corner (the animal is dangerous when ~ed) b : to catch and hold the attention of esp. to force an interview 2 : to get a corner on (~ the market) ~ vi 1 : to meet or converge at a corner or angle 2 : to turn a corner (the car ~s well)

cor-ner-back \kōr-när-bak\ n (1955) : a defensive halfback in football who defends the flank

corner kick n (1882) : a free kick from a corner of a soccer field awarded to an attacker when a defender plays the ball out-of-bounds over the end line

cor-ner-man \kōr-när-mən\ n (1957) 1 : one who plays in or near the corner; as a : CORNERBACK b : a basketball forward 2 : a boxer's second

cor-ner-stone \-stōn\ n (13c) 1 : a stone forming a part of a corner or angle in a wall; specif : such a stone laid at a formal ceremony 2 : a basic element: FOUNDATION (a ~ of foreign policy)

cor-ner-ways \-wāz\ adv (1922) : DIAGONALLY

cor-ner-wise \-wīz\ adv (15c) : DIAGONALLY

cor-net \kōr-nēt\ n [Br. usu \kōr-nīt\] [ME, fr. MF, fr. dim. of corn horn, fr. L *cornu*] (14c) 1 : a valved brass instrument resembling a trumpet in design and range but having a shorter partly conical tube and less brilliant tone 2 : something shaped like a cone: as a : a piece of paper twisted for use as a container b : a cone-shaped pastry shell that is often filled with whipped cream c Brit : an ice-cream cone

— cor-net-ist or cor-net-tist \kōr-nē-tist\, \kōr-nē-tist\ n

cor-ned \kōr-nēd\ adj (14c) 1 : fed or fattened on grain (as corn) (~ hogs) 2 : looking well-fed : PLUMP 3 : rustically wholesome or corny

corn-field \-fēld\ n (14c) : a field in which corn is grown

corn-flakes \-fläks\ n pl (1907) : toasted flakes made from the coarse meal of hulled corn for use as a breakfast cereal

corn flour n (1791) : CORNSTARCH

corn-flow-er \kōrn-flōōr\ n (1527) 1 : CORN COCKLE 2 : BACHELOR'S BUTTON

cornflower blue n (1907) : a moderate purplish blue

Corn-husk-er \kōrn-hos-kər\ n (ca. 1948) : a native or resident of Nebraska — used as a nickname

corn-husking \-hüs-kin\ n (1692) : a social gathering esp. of farm families to husk corn

cor-nice \kōr-nēs-, -nish\ n [MF, fr. frame, cornice, fr. L *cornic-*, cornix crow; akin to Gk *korax* raven — more at RAVEN] (1563) 1 a : the molded and projecting horizontal member that crowns an architectural composition b : a top course that crowns a wall 2 : a decorative band of metal or wood used to conceal curtain fixtures 3 : an overhanging mass of snow, ice, or rock usu. on a ridge

•cornice vt cor-niced; cor-nic-ing (1744) : to furnish or crown with a cornice

cor-niche \kōr-nēsh\ n [F *cornice*, corniche, lit., cornice, fr. It *cornice*] (1837) : a road built along a coast and esp. along the face of a cliff

cor-nic-u-late cartilage \kōr-nē-kyp-lāt\ n [L *corniculus* horned, fr. *corniculum*, dim. of *cornu* horn] (ca. 1909) : a small nodule of yellow elastic cartilage articulating with the apex of the arytenoid

cor-ni-fi-ca-tion \kōr-nē-fā'-kā-shən\ n [L *cornu horn*] (ca. 1843) 1 : conversion into or a horny substance or tissue 2 : the conversion of the vaginal epithelium from the columnar to the squamous type

•Cor-nish \kōr-nish\ adj [ME *Cornysse*, fr. *Cornwaille* Cornwall, England] (14c) 1 : of, relating to, or characteristic of Cornwall, Cornishmen, or Cornish

•Cornish n (1547) 1 : a Celtic language of Cornwall extinct since the late 18th century 2 : any of an English breed of domestic fowls much used in crossbreeding for meat production

Cor-nish-man \-mən\ n (15c) : a native or resident of Cornwall, England

Corn Law n (1766) : one of a series of laws in force in Great Britain before 1846 prohibiting or discouraging the importation of grain

corn leaf aphid n (ca. 1939) : a dusky greenish or brownish aphid (*Rhopalosiphum maidis*) that feeds on the flowers and foliage of various commercially important grasses (as Indian corn)

corn-meal \kōrn-mēl\ n (1749) : meal ground from corn

corn oil n (1900) : a yellow fatty oil obtained from the germ of Indian corn kernels and used chiefly as salad oil, in soft soap, and in margarine

corn-pone \kōrn-pōn\ adj (1972) : DOWN-HOME, COUNTRYIFIED (~ humor)

corn pone n (1859) Southern & Midland : corn bread often made without milk or eggs and baked or fried

best Available Copy